



Early Diagnosis of Breast Cancer: Public Health and Mammographic Screening

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Published online: 18 January 2018

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Abstract

Malignant breast tumors are the leading oncological pathology (after skin cancer) in the female population all over the world (more than 20%). According to American Cancer Society, breast cancer is expected to account for 30% of all new cancer cases among women in 2017 (Simon, 2017). The research in the sphere of the timely diagnosis of malignant neoplasms led to the development and further widespread implementation of screening programs, which help to reveal the disease before the onset of symptoms or signs of illness. The paper discusses different scientific approaches to mass screening, various opinions concerning the real impact of screening and contemporary treatment into breast cancer mortality decrease, and presents the results of a breast screening program in the Republic of Tatarstan (Russian Federation). The results showed the effectiveness of this diagnostic method: in 59,000 women aged 50–69 years in total, there were revealed 373 cases of breast cancer (0.63%), in which breast cancer of the I–II stage was 80%. Of the histological forms, 45.4% in the detected malignant neoplasms were presented by invasive ductal cancer, 24.8%—by invasive lobular carcinoma, and the proportion of non-invasive cancer was 4%. Cancer without metastatic involvement of lymphatic nodes (T1–4N0) occurred in 63% of cases. The paper discusses such negative factors of mass mammographic screening as overdiagnosis, false-positive results, and overtreatment. The analyses of existing research all over the world show that since the problem has been actively studied all over the world, the approach to the analysis of screening results has changed to the prevalence of individual approach to each case, the number of cases connected with overdiagnosis is constantly reduced, and the quality of visualization is rapidly improving due to the success of interdisciplinary research and rapid technical progress.

Keywords Public health · Breast cancer · Mammography · Mass screening · Cancer screening · Early diagnosis of cancer · Invasive ductal cancer · Invasive lobular carcinoma

1 Introduction

Malignant breast tumors are the leading oncological pathology (after skin cancer) in the female population all over the world (more than 20%). The research in the sphere of the timely diagnosis of malignant neoplasms led to the development and further widespread implementation of screening programs, which help to reveal the disease before the onset of symptoms or signs of illness. In the 1960s and 1980s, the population screening began to be practiced in the USA and a number of European countries. So, several decades have passed since the first screening programs for breast cancer by means of mammography. The effectiveness of this method as the main test in screening programs has been tested in many randomized trials conducted around the world. The wide development of screening programs in various countries of the world contributed to solving one of the main tasks in oncology—reducing the mortality from breast cancer.

Rinat Gamirov, Ludmila Komarova, Rustem Khasanov and Regina Gamirova contributed equally to this work.

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